and oxygen, he now gives the name of oxyiodine; and to its compounds with water, oxyiodic acid. To this same compound M. Gay-Lussac has given the name of iodic acid, and for the salts he uses the generic term iodates; but to this the author objects, that hydriodic and chloriodic acids may each be as well entitled to the appellation of iodic acids as a generic name, and that the termination in *at* places those bodies, which he calls oxyiodes, in the common class of neutral salts, from which they differ in many respects; while the term oxyiodes expresses more definitely the nature of a combination, which has the closest analogy with the bodies termed hyperoxymuriates.

On the Action of Acids on the Salts usually called Hyperoxymuriates, and on the Gases produced from them. By Sir Humphry Davy, *LL.D. F.R.S.* Read May 4, 1815. [*Phil. Trans.* 1815, *p.* 214.]

M. Gay-Lussac having obtained, by the action of sulphuric acid on hyperoxymuriate of barytes, a peculiar compound, to which he gave the name of chloric acid, the author was induced to examine the action of this and other acids on the hyperoxymuriate of potash, and after various attempts, found the following process with sulphuric acid to be the best. A small quantity, not exceeding fifty or sixty grains, of the hyperoxymuriate are to be mixed with a small quantity of the acid in its concentrated state, and to be rubbed together by means of a spatula of platina till incorporated into a solid mass of a bright orange colour. This mass having been introduced into a small retort, is to be then warmed by immersion in water gradually heated, but kept below the boiling point. As the heat rises, an elastic fluid is emitted of a bright yellowish green colour. This gas may be received over mercury, on which it has no action; but it is rapidly absorbed by water. Its smell is aromatic, without any smell of chlorine. It destroys vegetable blues, without previously reddening them. By a temperature of 212° it explodes with more violence than euchlorine, expanding more, and producing more light. After the explosion the volume is found increased in the proportion of 2 to 3; two parts of the product being oxygen, and the remainder chlorine.

Phosphorus introduced into this gas occasions an explosion, and burns in the liberated gases with its usual brilliancy; but other combustible bodies have no action on the gas.

Water saturated with the gas is of a deep yellow colour; it does not taste sour, but astringent and corrosive, leaving a lasting and disagreeable impression on the tongue.

It appears to the author not impossible, that the gas to which he formerly gave the name of euchlorine, may be a mixture of the new gas with chlorine; and indeed the action of water upon euchlorine favours this idea, since it acquires the same colour from it, and leaves a residuum of chlorine; but, on the contrary, the circumstance that Dutch foil has no action upon euchlorine, seems to show that it contains no free chlorine merely intermixed, but that the whole is chemically combined.

The saturated solution of the new gas in water, when mixed with alkaline solutions, does not immediately lose its colour, or neutralize the alkalies, but after a time the hyperoxymuriates are formed, and the colour disappears.

In consequence of the doubt which now occurs concerning the true nature of euchlorine, the author declines giving a name to the present compound, till he can have an opportunity of making some new experiments on that subject.

Farther analytical Experiments relative to the Constitution of the prussic, of the ferruretted chyazic, and of the sulphuretted chyazic Acids, and to that of their Salts; together with the Application of the Atomic Theory to the Analyses of those Bodies. *By* Robert Porrett, *jun. Esq.* *Communicated by* W. H. Wollaston, *M.D. Sec. R.S.* Read May 11, 1815. [*Phil. Trans.* 1815, *p.* 220.]

In a former paper the author endeavoured to show that prussic acid would combine with black oxide of iron, or with sulphur, and form with them peculiar acids, to which he gave the names of ferruretted and sulphuretted chyazic acids; and he examined in what proportion the elements of these new acids are combined, as well as the proportions in which the acids unite to different saline bases.

Mr. Porrett's present object is to add the results of two new analyses, made with great care, and to correct those inaccuracies of experiment, which are at all times unavoidable, by the assistance of the theory of Dalton respecting the relative weights of atoms, and of Berzelius respecting multiple doses of oxygen.

The first compound here examined, is prussiate of mercury. Ten grains of this salt were decomposed by hydrosulphuret of soda, and yielded 9·3 of black sulphuret of mercury. The residual liquor being treated with sulphate of copper, yielded 9·7 of sulphuretted chyazate of copper, which by former analyses is known to contain 1·38 prussic acid.

In order to determine the quantity of red oxide of mercury indicated by the weight of black sulphuret obtained, 25 grains of corrosive sublimate were decomposed by hydrosulphuret of potash, and yielded 21·5 grains; and since the quantity of red oxide contained in the sublimate is known to be $79\frac{3}{4}$ per cent., it is inferred that 9·3 black sulphuret are equivalent to 8·62 red oxide; and hence that 100 grains of prussiate of mercury consist of 13·8 prussic acid, and 86·2 red oxide of mercury.

For the purpose of determining the constitution of prussic acid, Mr. Porrett effected its decomposition by mixing prussiate of mercury with red oxide of mercury, in such proportion, that by the assistance of heat, the whole of the prussic acid might be converted into carbonic acid, azote, and water. By a number of trials he found that this was not completely effected till the quantity of red oxide added amounted to five times the quantity contained in the prussiate. In the decomposition of prussiate of mercury alone by heat, it is only